

1    **ABSTRACT**

2       Face detection techniques are provided that use a multiple-stage face detection  
3   algorithm. An exemplary three-stage algorithm includes a first stage that applies  
4   linear-filtering to enhance detection performance by removing many non-face-like  
5   portions within an image, a second stage that uses a boosting chain that is adopted  
6   to combine boosting classifiers within a hierarchy “chain” structure, and a third  
7   stage that performs post-filtering using image pre-processing, SVM-filtering and  
8   color-filtering to refine the final face detection prediction. In certain further  
9   implementations, the face detection techniques include a two-level hierarchy in-  
10   plane pose estimator to provide a rapid multi-view face detector that further  
11   improves the accuracy and robustness of face detection.